# UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6611

CSAH NO. 14

OVER THE

MINNESOTA RIVER

DISTRICT 8 - CHIPPEWA COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 93)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

## REPORT SUMMARY:

The substructure units inspected at Bridge No. 6611, Piers 1 and 2, were in good condition with no structurally significant defects observed. Both of the column footings at Pier 2 were exposed along the east face of the pier, but no undermining was detected. The steel sheeting that encased the upstream concrete column at Pier 2 and the steel pipe piles exhibited only light surface corrosion with no section loss observed. There was a moderate accumulation of timber debris observed along Pier 1. The channel bottom appeared stable with no evidence of scour or appreciable changes since the previous inspection.

## INSPECTION FINDINGS:

(A) The footing at Pier 2 was exposed along the east side of the upstream concrete column with 2 feet of vertical face exposure and along east side of the downstream concrete column with 10 inches of vertical face exposure.

(B) The upstream concrete column at Pier 2 was encased in steel sheeting that extended from the top of the footing to 2 inches above the waterline and exhibited light corrosion over 100 percent of the surface area. A gap in the steel sheeting, up to 1/4 inch wide, was observed at the south end of the column and extended from the top of the sheeting to 2 feet below the waterline.

(C) A moderate accumulation of timber debris, with pieces up to 1 foot in diameter, was observed along Pier 1.

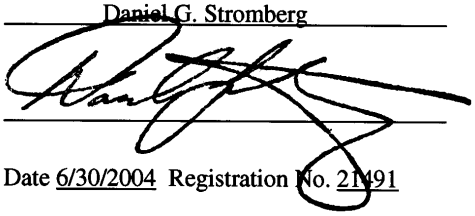
## RECOMMENDATIONS:

(A) Monitor the footing exposure at Pier 2 during future underwater inspections for further vertical face exposure and possible undermining of the footing.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

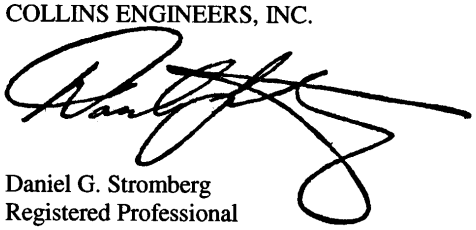
Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 6611

Feature Crossed: The Minnesota River

Feature Carried: CSAH No. 14

Location: District 8 - Chippewa County

Bridge Description: Bridge No. 6611 is a three span, multiple steel beam structure supported by two reinforced concrete abutments and two reinforced concrete piers founded on piles. The piers are numbered 1 and 2 starting from the west.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: October 31, 2002

Weather Conditions: Sunny, "20EF

Underwater Visibility: " 1 foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of two hexagon columns under a common pier cap, and two round steel shell piles outside of the columns supporting pier cap extensions. The two columns are supported by separate rectangular footings founded on H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.6 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the south side of Pier 2.

Water Surface: The waterline was approximately 13.6 feet below reference.
Waterline Elevation = 922.0.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

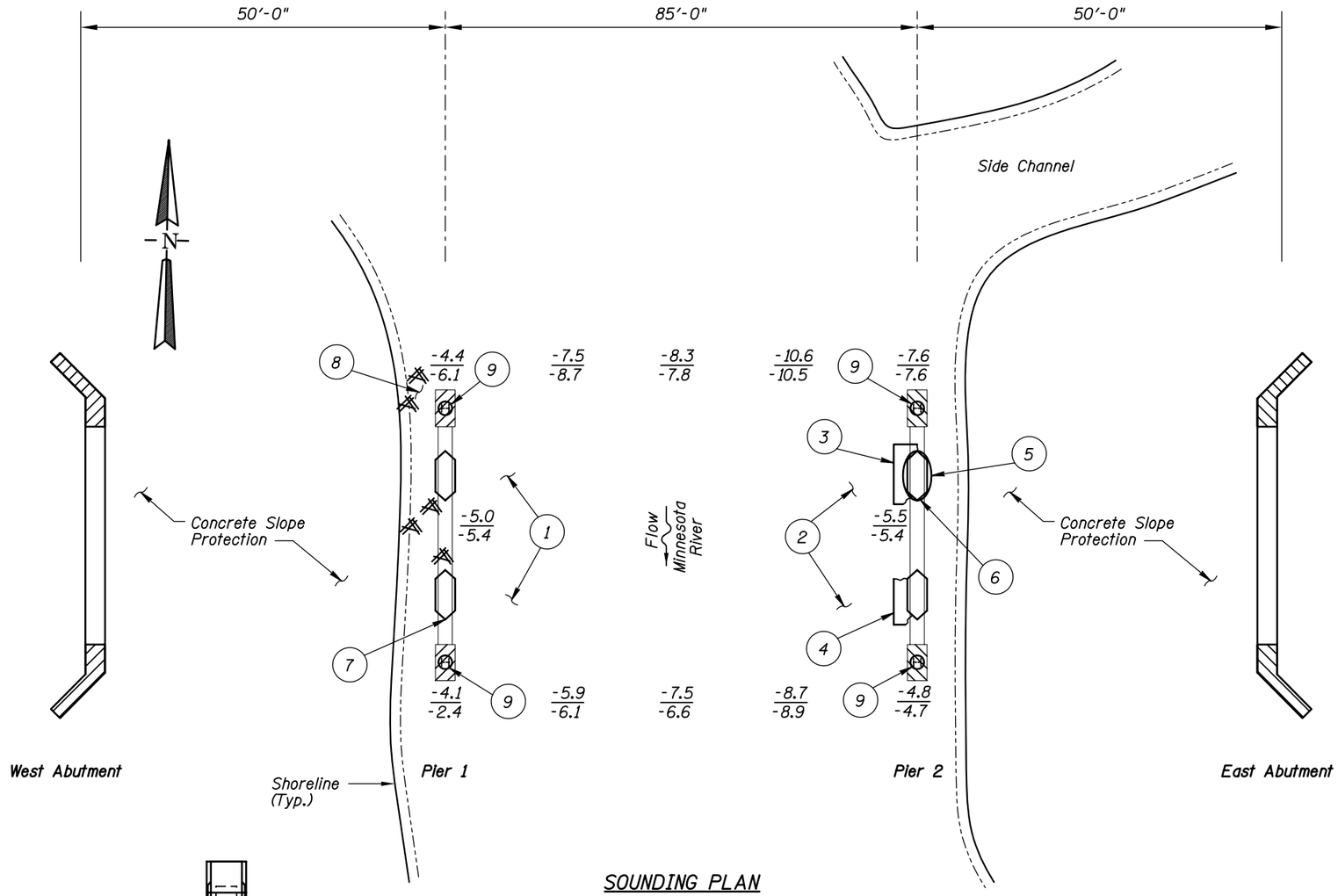
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/10/31

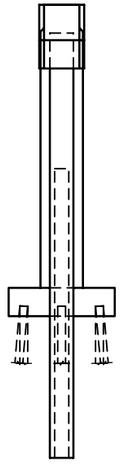
Item 113: Scour Critical Bridges: Code U/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No




SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 31, 2002, the waterline was located approximately 13.6 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds to a waterline elevation of 922.0 based on the previous report dated September 24, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted silty organic material with 4 inches of probe rod penetration.

(2) The channel bottom consisted of sand and riprap with up to 1 foot in diameter.

(3) The footing was exposed along the upstream concrete column of Pier 2 with 2 feet of vertical face exposure.

(4) The footing was exposed along the downstream concrete column of Pier 2 with 10 inches of vertical face exposure.

(5) The upstream concrete column was encased in steel sheeting that extended from the top of the footing to 2 inches above the waterline. Light corrosion was observed on 100 percent of the surface area of the steel sheeting.

(6) A gap in the steel sheeting, up to 1/4 inch wide, extended from the top of the sheeting to 2 feet below the waterline at the south end of the column.

(7) Minor areas of section loss were observed from the waterline to the channel bottom at the downstream end of the concrete column at Pier 1.

(8) A moderate accumulation of timber debris, with pieces up to 1 foot in diameter, was observed along Pier 1.

(9) The steel pipe piles exhibited minor surface corrosion above the waterline.

Legend

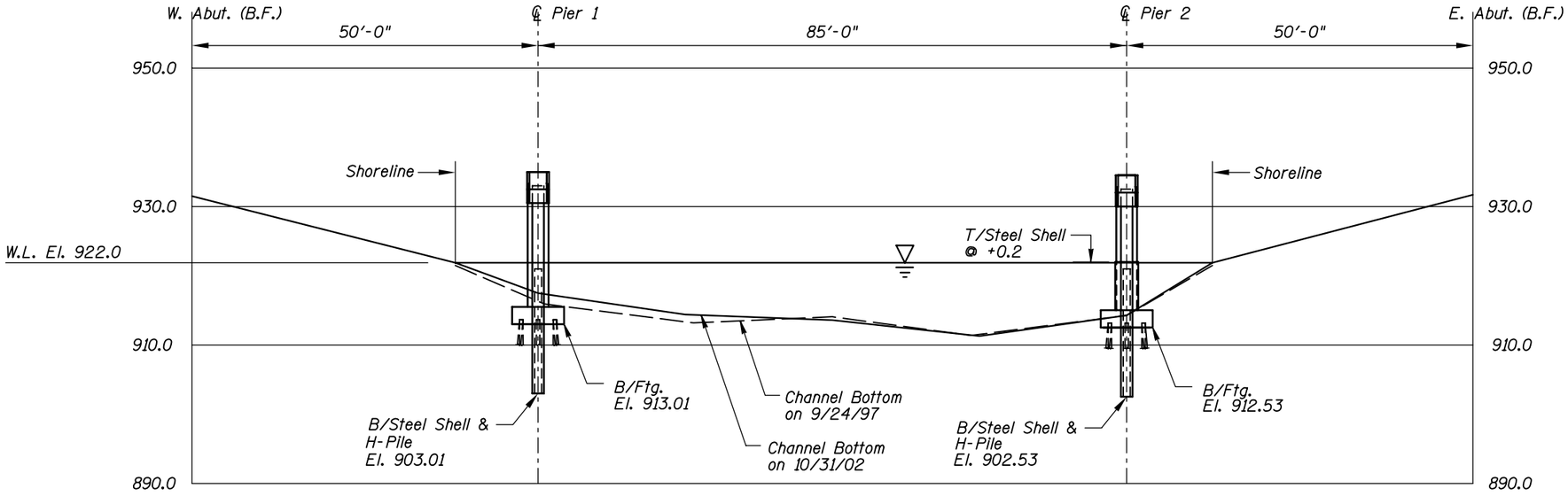
| | |
|---|---|
| -2.0 / -5.2 | Sounding Depth from Waterline (10/31/02) / Sounding Depth from Waterline (9/24/97) |
| ○ | Steel Pile Shell |
| H | Steel H-Pile |
| ▨ | Indicates Bridge Widening (c. 1990) |
| | Timber Debris |

**MINNESOTA**
**DEPARTMENT OF TRANSPORTATION**
**UNDERWATER BRIDGE INSPECTION**

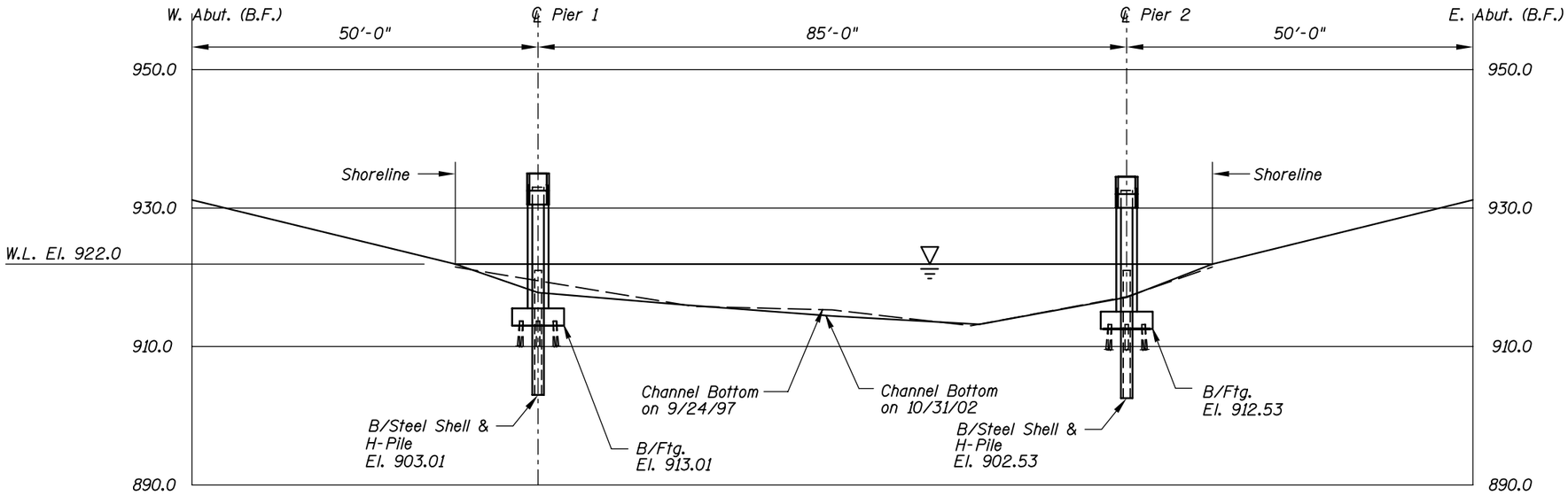
STRUCTURE NO. 6611
OVER THE MINNESOTA RIVER
DISTRICT 8, CHIPPEWA COUNTY

# INSPECTION AND SOUNDING PLAN

| | | |
|---|---|---|
| Drawn By: PRH | COLLINS ENGINEERS, INC. | Date: OCT. 2002 |
| Checked By: MDK | 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300 | Scale: NTS |
| Code: 35120093 | | Figure No.: 1 |




UPSTREAM FASCIA PROFILE




DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

**MINNESOTA**
**DEPARTMENT OF TRANSPORTATION**
**UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 6611
OVER THE MINNESOTA RIVER
DISTRICT 8, CHIPPEWA COUNTY

# UPSTREAM AND DOWNSTREAM FASCIA PROFILES

| | | |
|---|---|---|
| Drawn By: PRH | **COLLINS ENGINEERS, INC.** | Date: OCT. 2002 |
| Checked By: MDK | 300 W. WASHINGTON, STE. 600<br>CHICAGO, ILLINOIS 60606<br>(312) 704-9300 | Scale: 1"=20' |
| Code: 35120093 | | Figure No.: 2 |

Photograph 1. Overall View of the Structure, Looking North.

Photograph 2. View of Pier 1, Looking Northeast.

Photograph 3. View of Pier 2, Looking East.

Photograph 4. View of Upstream Column and Pile at Pier 2, Looking Northwest

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 31, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 6611 WEATHER: Sunny, "20EF
WATERWAY CROSSED: The Minnesota River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, Sounding Pole, Lead Line, Probe Rod, Lead Line, Camera
TIME IN WATER: 9:45 a.m.
TIME OUT OF WATER: 10:10 a.m.
WATERWAY DATA: VELOCITY Negligible/None
VISIBILITY "1 foot
DEPTH 7.6 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: The concrete and steel columns were in good condition with no structurally significant defects observed. Both of the column footings at Pier 2 were exposed along the east face of the pier with 2 feet of vertical exposure at the upstream column and 10 inches of vertical exposure at the downstream column. The steel sheeting that encased the upstream concrete column at Pier 2 and the steel pipe piles at both piers exhibited only light surface corrosion with no section loss observed. There was a moderate accumulation of timber debris observed along Pier 1. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

Monitor the footing exposure at Pier 2 during future underwater inspections for further vertical face exposure and possible undermining of the footing.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

# UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 6611
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Minnesota River

INSPECTION DATE October 31, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

## CONDITION RATING

| | | | SUBSTRUCTURE | | | | | | CHANNEL | | | | | GENERAL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT REFERENCE NO. | | MAXIMUM DEPTH OF WATER | PILING | COLUMNS, SHAFTS, OR FACES* | FOOTINGS | DISPLACEMENT | OTHER | OVERALL SUBSTRUCTURE CONDITION CODE* | SCOUR (FOOTING EXPOSURE) | EMBANKMENT EROSION | EMBANKMENT PROTECTION | OTHER (DRIFT/DEBRIS) | OVERALL CHANNEL & PROTECTION CONDITION | CONCRETE | STEEL | TIMBER | LOSS OF SECTION | PREVIOUS REPAIR OR MAINTENANCE | OTHER |
| | UNIT DESCRIPTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | Pier 1 | 5.0’ | 7 | 7 | N | 9 | N | 7 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | N | N | N | N |
| | Pier 2 | 7.6’ | 7 | 7 | 8 | 9 | N | 7 | 6 | 8 | 8 | N | 6 | 7 | 7 | N | 8 | 7 | N |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: The concrete and steel columns were in good condition with no structurally significant defects observed. Both of the column footings at Pier 2 were exposed along the east face of the pier with 2 feet of vertical exposure at the upstream column and 10 inches of vertical exposure at the downstream column. The steel sheeting that encased the upstream concrete column at Pier 2 and the steel pipe piles at both piers exhibited only light surface corrosion with no section loss observed. There was a moderate accumulation of timber debris observed along Pier 1. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.